

Embodied Simulation in the Art of Teaching Piano

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Abstract

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Recent studies show a close interrelation of emotions and movements in the music performance art, while the understanding of music is related to the modeling processes (embodied simulation), or the bodily transmission of music. It is clear that this approach is particularly promising for music pedagogy, and first of all for pedagogy of music performance. This view will help the beginning performer to find the most efficient way for a better understanding of musical emotion within the content of the musical piece, and, moreover, will contribute to the development of expressive technical skills. In this article we will study the embodied perspective in piano teaching, as well as the system of teaching methods, based on the motor modeling of musical rhythm.

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Keywords: Piano teaching, emotions, expressivity, embodied simulation, music performance, musical rhythm.

1. Introduction

Pedagogy of art has a number of specific properties, the main property is the special role of emotion, and artistic experience in all types of learning activity. Compared to other areas of education, a much greater role in art pedagogy is played by intuition, emotional, and creative processes. It allows for the definition of "Pedagogy of art as art." Music content specificity can create a problem in the understanding and perception of its emotional sense. At the same time it is a necessary requirement for any kind of musical activity. Full understanding and perception of music is important in all areas of musical activity, including artistic performance and pedagogy. The purpose of this report is to look for, and prove new approaches to solving the problem of musical knowledge, which will contribute to the effective comprehensive professional training of a prospective music teacher, both in terms of performance and methodology.



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2. Methodology

New opportunities to search for effective ways in this sphere are revealed with the latest scientific findings in neurophysiology and psychology of emotions, in the philosophical theory of knowledge. These milestone events in the human science have included the discovery of the mirror neuron system of the brain by Rizzolatti (2004); the emergence of new concepts in cognitive science, among which the interdisciplinary concept of the "embodied cognition" has become the leading one, as well as the studies on its future implementation in education (John B. Black, 2010; Doug Holton, 2010) et al. These ideas were continued by the concept of enactivism formulated by F. Varela, E. Rosch and E. Thompson in the book "The Embodied Mind" (1991), and in Music Cognition - Matyja J. R. & Schiavio A. (2013). According to the theory of the embodied cognition, cognitive abilities depend on the reconstruction of sensory and motor representations. The implementation of this concept in education is based on the unified approach to the brain and body, on the understanding that the learning processes and body movements are inseparably linked to each other. Theoretical and experimental research indicates that, the movement of the whole body or its parts may have a positive impact on the effectiveness of education, especially if these movements are integrated into the learning task.

The methodological basis for our research is the "embodied simulation theory" developed by Vittorio Gallese (2012), Marco Iacoboni (2004), which considers simulation (reproduction of the elements of a perceived phenomenon in movements, e.g. the expression of another person), as an important mechanism for the emergence of empathy. Music psychology and neuroscience research has shown that these processes also appear in the perception of music. They can be traced quite clearly and are related to the recognition of the emotional sense of music, that is, with the musical emotional responsiveness or musical empathy. The theory of the embodied cognition in terms of pedagogy has been actively developed in such areas as; learning languages, mathematics, and computer education technologies. This concept was considered in relation to music, mainly in the aspect of musical perception of listeners, but it hasn't been applied yet in the theory and practice of piano teaching. However, this theory so accurately explicates the essence of emotional and cognitive music processes, and therefore, so accurately complies with learning objectives and requirements of talented music teachers as the result of their creative musical and pedagogical intuition (Nadyrova, 2012).

The convergent approach which includes the analysis and integration of theoretical and experimental research in the related fields of human science, has been used in order to find the solution to the task at hand. It has resulted in the development of the system of methods for motor simulation in piano pedagogy, which is hierarchically built in accordance with the learning objectives and tasks. It is possible to speak about two main forms of simulation: a) when the melodic movement expression is reflected in gestures, and b) when the musical rhythm is reproduced in movements. We will consider the second form, which is the use of motor simulation in the course of work on the rhythm of performance. It is also known that the problem of rhythm is very important for learning to play the piano.

3. Movement and rhythm in music performance

Researchers observe the two most typical attributes of music rhythm. The first attribute is its ability to very actively affect the emotional state of listeners. The second attribute is its ability to arouse active motor reaction response, a sort of the "motor accompaniment for perception." The experimental results show that these two attributes are interrelated, and they determine each other's degree of intensity. It is also known that the rhythmic sense always requires support in external movement, in a distinct muscular sensation (Sechenov, 1961; Teplov, 1985). In this regard, the reasons for failures in the pianoforte work can be explained by the following circumstances: On the one hand, it is the traditional conservatism of the piano pedagogy, in which the problem of movements didn't usually go beyond basic pianistic movements, and pianoforte technical skills. All other movements not directly involved in sound production were perceived as unnecessary, harmful, or even as a manifestation of bad taste. On the other hand, it is the complexity of the performance process which consists of a huge variety of pianistic movements, large and small, very precise and differentiated by the strength and nature of touch. So, the introduction of additional emotionally determined movements, which could become the support for the rhythm sensation (e.g. rhythmical sway, head nods etc.) into this structure, really can disorganize this complex process.

It is true that the system of performing pianistic movements is so complicated, multi-layered and technically vulnerable that it is easy to lose "efface", or suppress natural motor rhythm sensation related to reproduction and imitation of rhythmic accents in large muscles. Therefore, to restore the natural sense of rhythm (rhythm emotions), it is advisable to temporarily separate it from the performance process of piano playing motor skills, and perceive and experience it as it is. In other words, it is necessary to separate in time two different motor processes – the performing process responsible for accurate sound reproduction, and the process of the motor physical embodiment of rhythm responsible for its emotional comprehension - in order to subsequently join these two processes in a new way. This physical embodiment can include various motor skills like; movements of arms, legs, and even the vocal apparatus (e.g. counting out loud or "rhythmic words or lines"). To put it another way, we use the method of imitation, motor simulation of musical rhythm in other "non-performance" spheres of human motor skills. The next important step is to convert these living, emotionally catching rhythm sensations (beats) into clear intra-aural presentations (but with preservation of motor sensations), and then to introduce them into an actual performing process without disturbing its naturalness and accuracy.

The method of music "physical embodiment" is often used in music pedagogy, but only as the way shown by a teacher, rather than a student. We often see a teacher gesticulating, stomping, clapping, and sometimes even dancing, trying to convey necessary mood or pace to the student playing the piano, to captivate him with emotion. It really helps, but it brings only a temporary effect, and as soon as the student loses this energy "recharge", his playing returns to the previous level. It is true that even watching someone else's expression gives good results because of the mirror neuron system (visual and auditory neurons), but it is not comparable to the student's own physical embodiment when he absorbs and perceives music with his body.

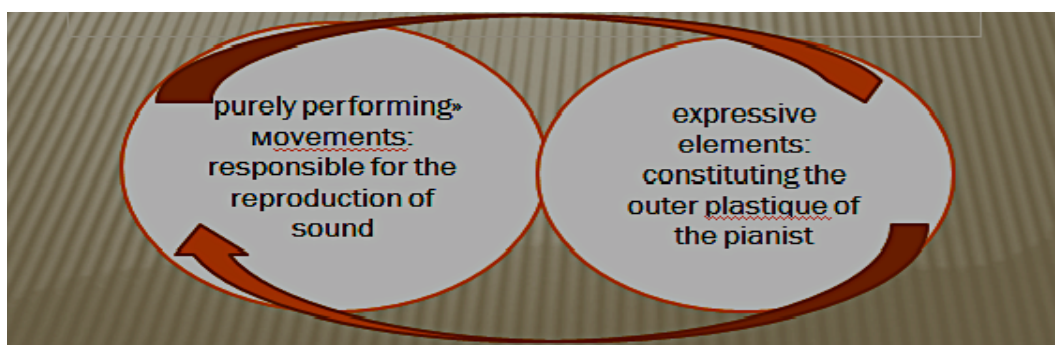


Fig. 1. Structure of the movements of the performing musician

Therefore, a teacher's responsibility is not only to show the character of the music in his movements, but to involve the student in this work and create an appropriate atmosphere during the class.

4. Motor simulation of rhythm

The following forms of rhythm motor simulation can be used in music education:

4.1 Traditional form of musical conducting

Firstly, it is a traditional form of musical conducting, which is used not for the control over other people, but for better perception of the music character by a performer. In the process of work on a piece of music H. Neuhaus advised "to act exactly the same way as the conductor when he works on a music score: put a music sheet on the music stand and conduct this music piece from the beginning to the end to master its rhythmic structure, i.e. its time process organization..." (Neuhaus, 2007). It is suitable for older students when learning large music pieces such as sonatas by Beethoven.

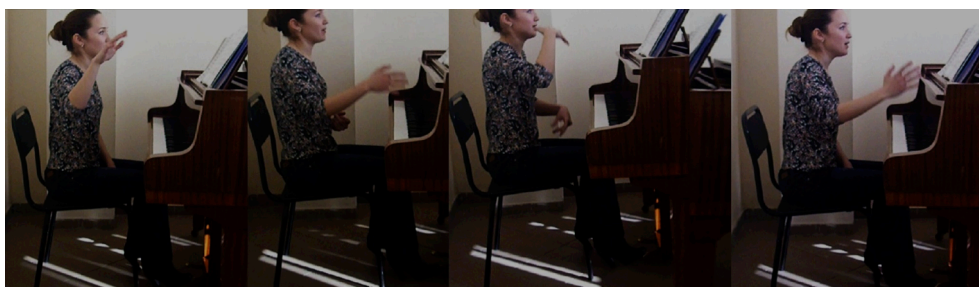


Fig. 2. Traditional form of musical conducting

4.2 Elementary conducting

Elementary conducting is free simulation of metric structure in simple hand movements, e.g. smoothness and softness in circular gestures

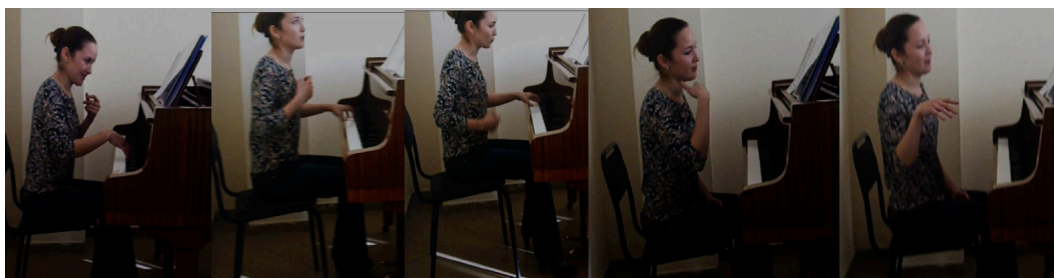


Fig. 3. Elementary conducting

4.3 Simulation of rhythm with clapping, tapping

Simulation of rhythm with clapping, tapping small elements of a rhythmic pattern, dotted and syncopated figures. These techniques help to better feel the brightness, clarity and clearness of a rhythmic pattern which are often lost in the process of playing due to difficult technique.

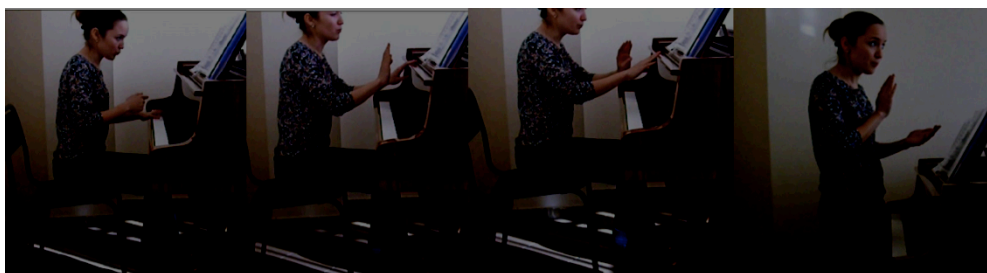


Fig. 4. Simulation of rhythm with clapping, tapping

4.4 Movements of the whole body

Movements of the whole body in the form of free improvisation (e.g. imagining movements of floating in water or a flying body) or using any dancing style (minuet, waltz, polka, boogie, tango), which enables the sense of rhythm especially in the work with young pianists.

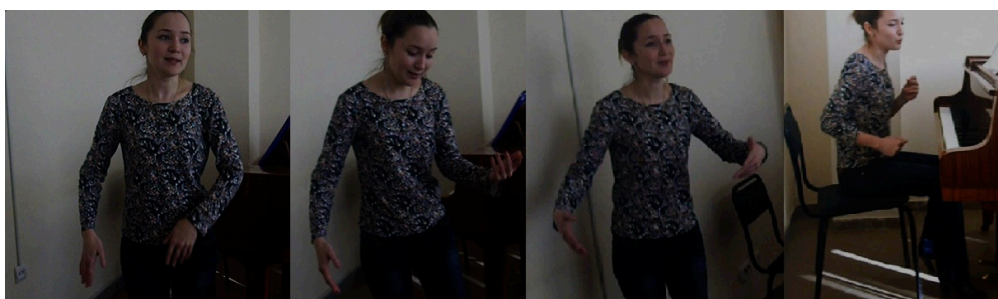


Fig.5. Movements of the whole body in the form of free improvisation

4.5 Movements of the legs

This is the movements of the legs in the form of careful, low voice "time beating". Remoteness and independence of these movements on the pianoforte motor skills shows, good muscle "perceptibility",

visibility, and inertial resistance. The ability to partially use it during the playing are important advantages of this technique.

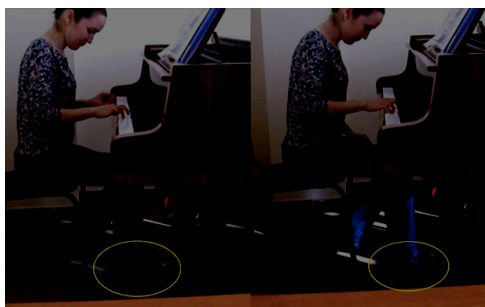


Fig. 6. Movements of the legs

A very important attribute of the music physical embodiment method is that, it develops rhythmic independence in students, releasing their own rhythmic feelings, which were bound to the keyboard. Rhythmic independence is possible, only when rhythm is naturally perceived through the whole body, without emotional restraints, the presence of genuine stability and reliability of metro-rhythm in the performance.

5. Conclusion

Motor simulation method is based on the selection and embodiment of the most emotionally significant elements of rhythm. In this way it is easier and more natural to vary and absorb their sensory individuality. It is similar to animated films or cartoons where the most expressive elements are exaggerated, and insignificant ones are obscured. In such a way, our perception focuses directly on the most important elements and doesn't waste time to select them in the stream of "excessive" information. As you can see, the concept of physical cognition amazingly conforms to music cognitive activity, which again confirms its reliability and versatility. It is clearly visible in music which is regarded by neuro-physiologists as the mirror of all psychical processes.

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References

- Black, J. B. (2010). An Embodied/Grounded Cognition Perspective on Educational Technology. In M.S. Khine and I. Saleh (Eds.). *New science of learning: Cognition, Computers and Collaboration in Education*.
- Gallese, V. (2012). Embodied simulation theory and intersubjectivity. - vittorio.gallese@unipr.it. Dept. of Neuroscience – Section of Physiology, University of Parma, Italy. 4, 2.
- Holton, D. (2010). Constructivism + Embodied Cognition = Enactivism: Theoretical and Practical Implications for Conceptual Change, AERA 2010 Conference.
- Iacoboni, M. (2003). Understanding others: imitation, language, empathy. In: *Perspectives on imitation: from cognitive neuroscience to social science*, Hurley, S., and Chapter, N. (Eds), Cambridge, MA: MIT Press, 2005.
- Matyja J. R. & Schiavio A. (2013). Enactive Music Cognition: Background and Research Themes. *Constructivist Foundations* 8(3), 351-357.

- Nadyrova, D.S. (2012). Expressive and communicative aspects of music and the performing pianist's abilities. *Philology and culture*, 3 (29). p.263-269. (in russ.). URL:http://philology-and-culture.kpfu.ru/?q=system/files/53_2.pdf.
- Neuhaus, H. (1987). *On the Art of Piano Playing* (in russ.). Moscow, Music.
- Rizzolatti, G., Craighero L. (2004). The Mirror-Neuron System. *Annual Rev. Neurosci*, 27, 169-92.
- Sechenov, I.M. (1961). *Reflexes of the Brain*. Moscow, 128.
- Teplov, B.M. (1985). *The selected works* (in 2 volumes) Publisher: Pedagogy, 1985.
- Varela F. J., Thompson E., Rosch E. (1991). *The embodied mind: Cognitive science and human experience*. Cambridge (Mass.).